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FINAL ANALYTICAL TAGA REPORT
INTERCONTINENTAL TERMINALS COMPANY
EPA Work Assignment No.: SERAS-372
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SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT # 0-375

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FINAL ANALYTICAL TAGA REPORT
INTERCONTINENTAL TERMINALS COMPANY
DEER PARK, TEXAS
JULY 2019

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FINAL ANALYTICAL TAGA REPORT
INTERCONTINENTAL TERMINALS COMPANY
DEER PARK, TEXAS
JULY 2019

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1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA)/Environmental Response Team (ERT) issued Work Assignment (WA) Number SERAS-372, Intercontinental Terminals Company (Site) in Deer Park, Texas (TX), to Leidos Innovations under the Scientific, Engineering, Response and Analytical Services (SERAS) contract. As an element of this WA, SERAS personnel were to conduct target compound ambient air monitoring using the ECA Trace Atmospheric Gas Analyzer (TAGA) IIe, to provide assistance to the USEPA/ERT and EPA Region 6 during the emergency response operations following a fire at the Intercontinental Terminals Company in Deer Park, TX.

The TAGA air monitoring events conducted from 21 March 2019 to 20 May 2019 were screening in nature. Air monitoring for benzene, toluene, and total xylenes was performed in accordance with the SERAS Standard Operating Procedure (SOP) # 1711, *Trace Atmospheric Gas Analyzer (TAGA) IIe Operations*. Real-time monitoring for the target compounds was performed using a selected ion technique.

2.0 METHODOLOGY

2.1 Mass Spectrometer/Mass Spectrometer General Theory

The ECA TAGA IIe is based upon the Perkin-Elmer API 365 mass spectrometer/mass spectrometer (MS/MS) and is a direct air-monitoring instrument capable of detecting, in real time, trace levels of many organic compounds in ambient air. The technique of triple quadrupole MS/MS is used to differentiate and quantitate compounds.

The initial step in the MS/MS process involves simultaneous chemical ionization of the compounds present in a sample of ambient air. The ionization produces both positive and negative ions by donating or removing one or more electrons. The chemical ionization is a "soft" ionization technique, which allows ions to be formed with little or no structural fragmentation. These ions are called parent ions. The parent ions with different mass-to-charge (m/z) ratios are separated by the first quadrupole (the first MS of the MS/MS system). The quadrupole scans selected m/z ratios allowing only the parent ions with these ratios to pass through the quadrupole. Parent ions with m/z ratios different from those selected are discriminated electronically and fail to pass through the quadrupole.

The parent ions selected in the first quadrupole are accelerated through a collision cell containing uncharged nitrogen molecules in the second quadrupole. A portion of the parent ions entering the second quadrupole fragments as they collide with the nitrogen molecules. These fragment ions are called daughter ions. This process, in the second quadrupole, is called collision induced dissociation. The daughter ions are separated according to their m/z ratios by the third quadrupole (the second MS of the MS/MS system). The quadrupole scans selected m/z ratios, allowing only the daughter ions with these ratios to pass through the quadrupole. Daughter ions with m/z ratios different from those selected are discriminated electronically and fail to pass through the quadrupole. Daughter ions with the selected m/z ratios are then counted by an electron multiplier. The resulting signals are measured in ion counts per second (icps) for each parent/daughter ion pair selected. The intensity of the icps for each parent/daughter ion pair is directly proportional to the ambient air concentration of the organic compound that produced the ion pair. All of the ions discussed in this report have a single charge. The m/z ratios of all of the ions discussed are equal to the ion masses in atomic mass units (amu). Therefore, the terms parent and daughter masses are synonymous with parent and daughter ion m/z ratios.

2.2 TAGA Procedure

The TAGA was used to analyze outdoor ambient air during mobile and stationary monitoring events. For mobile and stationary monitoring, one end of a 4-foot corrugated Teflon® sampling hose was attached to the TAGA source inlet, while the other was attached to a glass transfer tube passing through the wall of the vehicle during the monitoring event. Air was continuously drawn

through the hose at a set flow rate and transported to the TAGA source during the monitoring event.

2.2.1 TAGA Mass Calibration

At the beginning of the monitoring period, a gas mixture containing benzene, toluene, xylenes, tetrachloroethene, trichloroethene, 1,1-dichloroethene, and vinyl chloride was introduced by a mass flow controller (MFC) into the sample air flow (SAF). The tuning parameters for the first quadrupole at 30, 78, 106, 130, and 166 amu, and the third quadrupole at 30, 78, 105, 129, and 166 amu were optimized for sensitivity and mass assignment. The peak widths were limited between 0.55 amu and 0.85 amu. The mass assignments were set to the correct values within 0.15 amu.

2.2.2 TAGA Response Factor Measurements

The TAGA was calibrated for the target compounds at the beginning, beginning and end, or beginning, middle, and end of the day depending on environmental constraints. The calibration system consisted of a regulated gas cylinder containing a gas standard mixture of the target compounds connected to an in-line MFC. The MFC was calibrated with a National Institute of Standards and Technology (NIST) traceable flow rate meter. The gas standard certification is presented in Appendix A. The gas standard containing a known mixture of target compounds, certified by the supplier, was regulated at preset flow rates, and diluted with ambient air. The dilution of the gas standard resulted in known analyte concentrations. The calibration consisted of a zero point and five known concentrations obtained by setting the MFC to 0, 10, 20, 40, 80, and 90 milliliters per minute (mL/min) with the SAF at 1,500 milliliters per second (mL/sec).

The approximate concentration range of standards introduced into the TAGA was between 1 and 30 parts per billion by volume (ppbv). Utilizing the analytes' concentrations, gas flow rates, and air sampling flow rates, the response factors (RFs), in units of ion counts per second per part per billion by volume (icps/ppbv), were calculated for each ion pair by using a least-square-fit algorithm to calculate the slope of its curve. The coefficient of correlation was checked for each ion pair's RF to ensure that it was greater than 0.90. The RF of each analyte was used to quantify the target compounds in ambient air and the intermediate response factor (IRF) were calculated between pairs of calibrations. Both the RF and the IRF were used to quantify target compounds in ambient air. Calibration data are included in Appendix B.

2.2.3 TAGA Air Monitoring

TAGA monitoring was performed by continuously drawing air through the Teflon® hose at a flow-rate of approximately 1,500 mL/sec. The air was then passed through a glass splitter where the pressure gradient between the mass spectrometer core and the atmosphere causes a sample flow of approximately 10 mL/min into the ionization source through a heated transfer line. The flow into the TAGA source was controlled so that the ionization source pressure was maintained at an optimum value of approximately 1.8 torr. The remaining airflow was drawn through the air pump and vented from the TAGA bus.

Monitoring was performed in the parent/daughter ion-monitoring mode. As monitoring proceeded, the operator pressed letter keys (flags), alphabetically on a computer keyboard, to denote events or locations during the monitoring event. This information was also recorded on an event log sheet. The intensity of each parent/daughter ion pair monitored by the TAGA was recorded in a permanent file on the computer's hard drive. One set of recorded measurements of all the ion pairs is called a sequence.

Mobile monitoring was conducted continuously along a recorded path. Stationary

monitoring was conducted continuously at a fixed location. At the conclusion of mobile or stationary monitoring event, a one-minute ambient data segment was collected. Upon completion of the one-minute post-monitoring ambient data segment, the instrumentation was challenged with the calibration standard, which was introduced at 30 mL/min (approximately 6.7 ppbv, and total xylenes at approximately 10 ppbv), to verify that the system was functioning properly.

2.3 Global Positioning System (GPS) and Tracking

The mobile laboratory is equipped with a Trimble Pro 6T GPS receiver that streams geographical coordinates to a personal computer. The coordinates represent position of the TAGA mobile laboratory in real-time. The instrument data are synchronized with the GPS coordinates, so the monitoring data can be directly associated with the position of the mobile laboratory as indicated by the GPS system at any time during the mobile monitoring period. The synchronized information is recorded into the data repository (database) and uploaded to the USEPA/ERT VIPER data management system in real-time to be archived on a USEPA/ERT server.

2.4 Meteorological Monitoring

United States Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center provided the meteorological data for one weather station in the vicinity of mobile monitoring events. Data were collected from the William P Hobby Airport located in Houston, TX from 09 May 2019 through 16 May 2019.

The Texas Commission on Environmental Quality (TCEQ) provided the meteorological data for two weather stations in the vicinity of the mobile monitoring and stationary monitoring events. Data were collected from the Houston Deer Park #2 weather station located in Deer Park, TX from 19 March 2019 through 20 May 2019 and from the La Porte Municipal Airport weather station located in La Porte, TX from 19 March 2019 through 20 May 2019.

Meteorological data, such as wind speed, wind direction, and rainfall, are summarized in Table 1 for the beginning of the period during which monitoring occurred. The compiled meteorological data are presented in Appendix C. The reported data for rainfall are an average of the data recorded during the hour preceding the time recorded in the table. The reported meteorological data for wind speed and direction represent a five-minute average collected prior to the time recorded in the table. Because of the distance of the meteorological monitoring location from the study location and the short averaging period, care should be exercised in relating meteorological conditions existing at the Site.

3.0 TAGA AIR MONITORING RESULTS

The TAGA was used to conduct Mobile Monitoring and Stationary Monitoring at and around the Site.

3.1 Mobile Monitoring Paths and Stationary Locations

Figures 1a, 2a, 4a through 130a, and 132a through 316a present the monitoring paths taken by the TAGA mobile laboratory as it traveled in the vicinity of the Site. Figures 3a and 131a present the locations where stationary monitoring was conducted in the vicinity of the Site. The maps, representing the monitoring path and stationary locations are marked by letters. These letters are the “flags” that the TAGA operator placed into the file. These "flags" mark events or locations and are referenced in the Discussion of Results presented in Section 4.0.

3.2 TAGA File Event Summaries

Figures 1b through 316b present the TAGA file event summaries. These are observations made during the file acquisition by the TAGA operator, along with the time from the TAGA file and the

letter “flags” used to mark the data, which are recorded by the TAGA computer.

3.3 Graphical Presentations

Figures 1c through 316c are the graphical representations of the TAGA files. A graph of each target compound concentration is presented in ppbv plotted on the vertical axis, and time into the acquisition, in minutes, on the horizontal axis. The target compound concentration was calculated by averaging the concentrations obtained from the ion pairs that were monitored for each target compound. There are two horizontal lines on each graph. The lower line is set at the detection limit (DL) for the compound. The higher line is set at the concentration equal to the quantitation limit (QL) for the target compound. When high concentrations are represented, the lower DL line may not be readily discerned. Transient momentary spikes above the QL line are occasionally observed. These spikes, electronic in nature, do not affect average concentrations. They may be distinguished from elevated concentrations because the spikes are only present for one sequence and are often only present for one ion pair of the monitored compound.

4.0 DISCUSSION OF RESULTS

TAGA mobile monitoring and stationary monitoring was conducted between 21 March 2019 and 20 May 2019. The TAGA monitoring is screening in nature. During each mobile or stationary monitoring period, the TAGA mobile laboratory monitored continuously while moving along the monitoring paths on remaining stationary in a fixed location. Only mobile or stationary monitoring events that contained instantaneous maximum concentrations of a target compound above the short-term Air Monitoring Comparison Values (AMCVs), as determined by the TCEQ, are discussed below. The AMCVs for benzene, toluene, and total xylenes are 180 ppbv, 4,000 ppbv, and 1,700 ppbv respectively.

All results are presented in ppbv and micrograms per cubic meter (µg/m^3) and include the time and location where the maximums were observed. A summary of instantaneous maximum concentrations in ppbv, and correlated meteorological data, for all monitoring runs is presented in Table 1.

4.1 Monitoring Highway 8 East, 64MSMS00709

Monitoring Highway 8 East was performed on 21 March 2019 at 8:54:24 and is represented in Figure 1. The average wind speed and direction for the five-minute period ending at 9:00 were 3.3 miles per hour (mph) from 55 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 200 ppbv (640 µg/m^3), was detected at 13.790 minutes into the monitoring run while traveling North on Highway 8 between Greenshadow Drive and the Pasadena Freeway East ramp between flags F and G. The highest instantaneous maximum concentration of toluene, at 20 ppbv (76 µg/m^3), was detected at 15.095 minutes into the monitoring run while merging onto Highway 225 East between flags G and H. The highest instantaneous maximum concentration of xylenes, at 8.2 ppbv (36 µg/m^3), was detected at 16.431 minutes into the monitoring run while merging onto Highway 225 East between flags G and H. The concentration for benzene exceeded the linear calibration range and is considered estimated.

4.2 Monitoring Highway 225 West, 64MSMS00716

Monitoring Highway 225 West was performed on 21 March 2019 at 16:21:15 and is represented in Figure 7. The average wind speed and direction for the five-minute period ending at 17:00 were 3.6 mph from 331 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 3,300 ppbv (11,000 µg/m^3),

and toluene, at 720 ppbv (2,700 µg/m^3), were detected at 13.727 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags D and E. The highest instantaneous maximum concentration of xylenes, at 800 ppbv (3,500 µg/m^3), was detected at 13.769 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags D and E. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.3 Monitoring Independence Parkway to Battleground Park, 64MSMS00723

Monitoring Independence Parkway to Battleground Park was performed on 22 March 2019 at 12:58:32 and is represented in Figure 12. The average wind speed and direction for the five-minute period ending at 13:00 were 6.1 mph from 140 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 1,700 ppbv (5,400 µg/m^3), was detected at 9.194 minutes into the monitoring run while traveling northeast on Vista Road near the Site between flags E and F. The highest instantaneous maximum concentration of toluene, at 550 ppbv (2,100 µg/m^3), was detected at 9.215 minutes into the monitoring run while traveling northeast on Vista Road near the Site between flags E and F. The highest instantaneous maximum concentration of xylenes, at 600 ppbv (2,600 µg/m^3), was detected at 9.204 minutes into the monitoring run while traveling northeast on Vista Road near the Site between flags E and F. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.4 Monitoring Channelview Three, 64MSMS00727

Monitoring Channelview Three was performed on 22 March 2019 at 15:39:44 and is represented in Figure 14. The average wind speed and direction for the five-minute period ending at 16:00 were 10.3 mph from 128 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 1,100 ppbv (3,500 µg/m^3), was detected at 48.007 minutes into the monitoring run while stationary on Peninsula Street (San Jacinto Boulevard) between flags M and N. The highest instantaneous maximum concentrations of toluene, at 400 ppbv (1,500 µg/m^3), and xylenes, at 430 ppbv (1,900 µg/m^3), were detected at 48.354 minutes into the monitoring run while stationary on Peninsula Street (San Jacinto Boulevard) between flags M and N. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.5 Monitoring Highway 225 Eastbound, 64MSMS00731

Monitoring Highway 225 Eastbound was performed on 23 March 2019 at 9:02:05 and is represented in Figure 16. The average wind speed and direction for the five-minute period ending at 10:00 were 12.1 mph from 127 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 210 ppbv (660 µg/m^3), was detected at 31.651 minutes into the monitoring run while traveling east on Highway 10 between Dell Dale Street and Sheldon Road between flags R and S. The highest instantaneous maximum concentration of toluene, at 66 ppbv (250 µg/m^3), was detected at 31.672 minutes into the monitoring run while traveling east on Highway 10 between Dell Dale Street and Sheldon Road between flags R and S. The highest instantaneous maximum concentration of xylenes, at 62 ppbv (270 µg/m^3), was detected at 24.614 minutes into the monitoring run while traveling east on Market Street between Federal Road and Miles Street between flags N and O. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.6 Monitoring Northwest of Site, 64MSMS00735

Monitoring Northwest of Site was performed on 23 May 2019 at 14:46:26 and is represented in Figure 20. The average wind speed and direction for the five-minute period ending at 15:00 were 12.7 mph from 124 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 820 ppbv (2,600 µg/m^3), was detected at 54.960 minutes into the monitoring run while traveling west on Jacintoport Boulevard between flags K and L. The highest instantaneous maximum concentration of toluene, at 160 ppbv (620 µg/m^3), was detected at 55.002 minutes into the monitoring run while traveling west on Jacintoport Boulevard between flags K and L. The highest instantaneous maximum concentration of xylenes, at 130 ppbv (550 µg/m^3), was detected at 54.981 minutes into the monitoring run while traveling while traveling west on Jacintoport Boulevard between flags K and L. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.7 Monitoring Highway 10 East, 64MSMS00738

Monitoring Highway 10 East was performed on 24 March 2019 at 8:43:50 and is represented in Figure 21. The average wind speed and direction for the five-minute period ending at 9:00 were 10.1 mph from 161 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 210 ppbv (670 µg/m^3), was detected at 65.257 minutes into the monitoring run while traveling west on Jacintoport Boulevard between flags Q and R. The highest instantaneous maximum concentration of toluene, at 140 ppbv (530 µg/m^3), was detected at 65.447 minutes into the monitoring run while traveling west on Jacintoport Boulevard between flags Q and R. The highest instantaneous maximum concentration of xylenes, at 320 ppbv (1,400 µg/m^3), was detected at 65.478 minutes into the monitoring run while traveling while traveling west on Jacintoport Boulevard between flags K and L. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.8 Monitoring Lynchburg to Channelview, 64MSMS00743

Monitoring Lynchburg to Channelview was performed on 24 May 2019 at 15:14:11 and is represented in Figure 25. The average wind speed and direction for the five-minute period ending at 16:00 were 10.1 mph from 161 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 410 ppbv (1,300 µg/m^3), was detected at 80.446 minutes into the monitoring run while traveling east on Jacintoport Boulevard between flags X and Y. The highest instantaneous maximum concentration of toluene, at 150 ppbv (580 µg/m^3), was detected at 82.812 minutes into the monitoring run while traveling east on Jacintoport Boulevard between flags X and Y. The highest instantaneous maximum concentration of xylenes, at 200 ppbv (870 µg/m^3), was detected at 80.456 minutes into the monitoring run while traveling while traveling east on Jacintoport Boulevard between flags X and Y. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.9 Monitoring ITC Site and Vista Drive, 64MSMS00753

Monitoring ITC Site and Vista Drive was performed on 25 March 2019 at 15:48:25 and is represented in Figure 31. The average wind speed and direction for the five-minute period ending at 16:00 were 4.5 mph from 262 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 3,600 ppbv (12,000 µg/m^3), toluene, at 1,100 ppbv (4,200 µg/m^3), and xylenes, at 600 ppbv (2,600 µg/m^3), were detected at 10.014 minutes into the monitoring run while traveling northeast on Vista Road near the Site between flags C and D. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.10 Monitoring Independence Parkway, 64MSMS00765

Monitoring Independence Parkway was performed on 26 March 2019 at 15:58:10 and is represented in Figure 37. The average wind speed and direction for the five-minute period ending at 16:00 were 4.6 mph from 33 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 250 ppbv (790 µg/m^3), and toluene, at 99 ppbv (370 µg/m^3), were detected at 30.399 minutes into the monitoring run while stationary at the intersection of Independence Parkway and Vista Road near the Site between flags H and I. The highest instantaneous maximum concentration of xylenes, 210 ppb (900 µg/m^3), was detected at 30.388. minutes into the monitoring run while stationary at the intersection of Independence Parkway and Vista Road near the Site between flags H and I. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.11 Monitoring Channelview, 64MSMS00776

Monitoring Channelview was performed on 27 March 2019 at 15:20:51 and is represented in Figure 43. The average wind speed and direction for the five-minute period ending at 16:00 were 9.1 mph from 138 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 370 ppbv (1,200 µg/m^3), and toluene, at 67 ppbv (250 µg/m^3), were detected at 32.923 minutes into the monitoring run while traveling east on San Jacinto Boulevard (Peninsula Street) flags M and N. The highest instantaneous maximum concentration of xylenes, 28 ppb (120 µg/m^3), was detected at 32.892. minutes into the monitoring run while stationary at the intersection of Independence Parkway and Vista Road near the Site between flags H and I. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.12 Monitoring Channelview, 64MSMS00796

Monitoring Channelview was performed on 29 March 2019 at 11:11:15 and is represented in Figure 55. The average wind speed and direction for the five-minute period ending at 11:00 were 12.6 mph from 154 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 480 ppbv (1,500 µg/m^3), was detected at 21.963 minutes into the monitoring run while traveling north on Sheldon Road between flags I and J. The highest instantaneous maximum concentration of toluene, at 53 ppbv (200 µg/m^3), was detected at 22.100 minutes into the monitoring run while traveling north on Sheldon Road between flags I and J. The highest instantaneous maximum concentration of xylenes, at 28 ppbv (120 µg/m^3), was detected at 80.456 minutes into the monitoring run while traveling while traveling east on Market Street between flags J and K. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.13 Monitoring Channelview Two, 64MSMS00797

Monitoring Channelview Two was performed on 29 March 2019 at 12:05:22 and is represented in Figure 56. The average wind speed and direction for the five-minute period ending at 13:00 were 13.2 mph from 154 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 820 ppbv (2,600 µg/m^3), was detected at 16.125 minutes into the monitoring run while traveling south on Sheldon Road between flags E and F. The highest instantaneous maximum concentrations of toluene, at 98 ppbv (370 µg/m^3), and xylenes, at 36 ppbv (160 µg/m^3), were detected at 16.115 minutes into the monitoring run while traveling south on Sheldon Road between flags E and F. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.14 Monitoring Channelview Three, 64MSMS00800

Monitoring Channelview Three was performed on 29 March 2019 at 14:46:20 and is represented in Figure 57. The average wind speed and direction for the five-minute period ending at 15:00 were 12.5 mph from 155 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 1,600 ppbv (5,100 µg/m^3), was detected at 11.413 minutes into the monitoring run while traveling east on Jacintoport Boulevard between flags C and D. The highest instantaneous maximum concentration of toluene, at 230 ppbv (860 µg/m^3), was detected at 11.434 minutes into the monitoring run while traveling east on Jacintoport Boulevard between flags C and D. The highest instantaneous maximum concentration of xylenes, at 70 ppbv (300 µg/m^3), was detected at 11.676 minutes into the monitoring run while traveling east on Jacintoport Boulevard between flags C and D. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.15 Monitoring Channelview Two, 64MSMS00807

Monitoring Channelview Two was performed on 30 March 2019 at 9:54:35 and is represented in Figure 61. The average wind speed and direction for the five-minute period ending at 10:00 were 5.0 mph from 222 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 690 ppbv (2,200 µg/m^3), was detected at 8.552 minutes into the monitoring run while exiting from Highway 10 West onto the East Freeway Frontage Road at Magnolia Street between flags F and G. The highest instantaneous maximum concentration of toluene, at 83 ppbv (310 µg/m^3), was detected at 8.563 minutes into the monitoring run while exiting from Highway 10 West onto the East Freeway Frontage Road at Magnolia Street between flags F and G. The highest instantaneous maximum concentration of xylenes, at 29 ppbv (130 µg/m^3), was detected at 36.615 minutes into the monitoring run while traveling west on Market Street near the intersection with Monmouth Street between flags U and V. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.16 Monitoring Highland Channelview, 64MSMS00811

Monitoring Highland Channelview was performed on 30 March 2019 at 14:01:36 and is represented in Figure 63. The average wind speed and direction for the five-minute period ending at 15:00 were 5.5 mph from 337 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 200 ppbv (640 µg/m^3), and toluene, at 25 ppbv (94 µg/m^3), were detected at 70.253 minutes into the monitoring run while traveling southeast on Decker Drive between flags V and W. The instantaneous concentration of xylenes, at 13 ppbv (55 µg/m^3), was detected at 8.124 minutes into the monitoring run while traveling west on East Freeway Frontage Road near the intersection of Eastpoint Boulevard between flags D and E. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.17 Monitoring Deer Park, 64MSMS00812

Monitoring Deer Park was performed on 30 March 2019 at 15:24:03 and is represented in Figure 64. The average wind speed and direction for the five-minute period ending at 16:00 were 9.2 mph from 334 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 390 ppbv (1,200 µg/m^3), was detected at 23.636 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road between Miller Cutoff Road and Sens Road between flags J and K. The highest instantaneous maximum concentration of toluene, at 50 ppbv (190 µg/m^3), was detected at 23.678 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road between Miller Cutoff Road and Sens Road between flags J and K. The highest instantaneous maximum concentration of xylenes, at 16 ppbv (69 µg/m^3), was detected at 23.625 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road between Miller Cutoff Road and Sens Road between flags J and K. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.18 Monitoring Pasadena to Deer Park, 64MSMS00816

Monitoring Pasadena to Deer Park was performed on 31 March 2019 at 8:42:50 and is represented in Figure 66. The average wind speed and direction for the five-minute period ending at 9:00 were 6.3 mph from 25 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 1,000 ppbv (3,300 µg/m^3), was detected at 22.342 minutes into the monitoring run while traveling east on Thirteenth Street near the intersection of East Boulevard between flags I and J. The highest instantaneous maximum concentration of toluene, at 220 ppbv (830 µg/m^3), was detected at 22.321 minutes into the monitoring run while traveling east on Thirteenth Street near the intersection of East Boulevard between flags I and J. The highest instantaneous maximum concentration of xylenes, at 120 ppbv (510 µg/m^3), was detected at 22.363 minutes into the monitoring run while traveling east on Thirteenth Street near the intersection of East Boulevard between flags I and J. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.19 Monitoring Deer Park, 64MSMS00817

Monitoring Deer Park was performed on 31 March 2019 at 9:47:02 and is represented in Figure 67. The average wind speed and direction for the five-minute period ending at 10:00 were 6.7 mph from 14 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 840 ppbv (2,700 µg/m^3), was detected at 48.438 minutes into the monitoring run while traveling east on Thirteenth Street near San Jacinto Elementary School between flags P and Q. The highest instantaneous maximum concentration of toluene, at 150 ppbv (580 µg/m^3), was detected at 3.629 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road the intersection of East Boulevard between flags A and B. The highest instantaneous maximum concentration of xylenes, at 83 ppbv (360 µg/m^3), was detected at 3.566 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road the intersection of East Boulevard between flags A and B. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.20 Monitoring Deer Park Two, 64MSMS00818

Monitoring Deer Park Two was performed on 31 March 2019 at 11:01:18 and is represented in Figure 68. The average wind speed and direction for the five-minute period ending at 11:00 were 6.0 mph from 14 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 790 ppbv (2,500 µg/m^3), and xylenes, at 60 ppbv (260 µg/m^3), were detected at 29.242 minutes into the monitoring run while traveling west on X Street near the intersection of East Boulevard between flags L and M. The highest instantaneous maximum concentration of toluene, at 140 ppbv (540 µg/m^3), was detected at 29.231 minutes into the monitoring run while traveling west on X Street near the intersection of East Boulevard between flags L and M. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.21 Monitoring Deer Park Three, 64MSMS00822

Monitoring Deer Park Three was performed on 31 March 2019 at 12:46:23 and is represented in Figure 69. The average wind speed and direction for the five-minute period ending at 13:00 were 6.8 mph from 13 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 790 ppbv (2,500 µg/m^3), and toluene, at 120 ppbv (470 µg/m^3), were detected at 12.349 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road near the intersection of East Boulevard between flags H and I. The highest instantaneous maximum concentration of xylenes, at 60 ppbv (260 µg/m^3), was detected at 12.212 minutes into the monitoring run while traveling east on Pasadena Freeway Frontage Road near the intersection of East Boulevard between flags H and I. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.22 Monitoring Deer Park Four, 64MSMS00823

Monitoring Deer Park Four was performed on 31 March 2019 at 13:47:03 and is represented in Figure 70. The average wind speed and direction for the five-minute period ending at 14:00 were 5.5 mph from 359 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 390 ppbv (1,200 µg/m^3), and toluene, at 61 ppbv (230 µg/m^3), were detected at 19.186 minutes into the monitoring run while traveling west on Thirteenth Street near the intersection of East Boulevard between flags G and H. The highest instantaneous maximum concentration of xylenes, at 22 ppbv (96 µg/m^3), was detected at 19.512 minutes into the monitoring run while traveling west on Thirteenth Street near the intersection of East Boulevard between flags G and H. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.23 Monitoring Deer Park Five, 64MSMS00824

Monitoring Deer Park Five was performed on 31 March 2019 at 14:33:51 and is represented in Figure 71. The average wind speed and direction for the five-minute period ending at 15:00 were 5.9 mph from 18 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 450 ppbv (1,400 µg/m^3), was detected at 16.914 minutes into the monitoring run while traveling west on X Street between East Boulevard and Luella Ave between flags I and J. The highest instantaneous maximum concentration of toluene, at 68 ppbv (260 µg/m^3), was detected at 16.925 minutes into the monitoring run while traveling west on X Street between East Boulevard and Luella Avenue between flags I and J. The highest instantaneous maximum concentration of xylenes, at 27 ppbv (120 µg/m^3), was detected at 23.152 minutes into the monitoring run while traveling east on San Augustine Street between Luella Avenue and East Boulevard between flags K and L. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.24 Monitoring Deer Park Six, 64MSMS00825

Monitoring Deer Park Six was performed on 31 March 2019 at 15:33:55 and is represented in Figure 72. The average wind speed and direction for the five-minute period ending at 16:00 were 5.9 mph from 25 degrees. There was 0.01 inches of precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 400 ppbv (1,300 µg/m^3), was detected at 11.643 minutes into the monitoring run while traveling west on X Street between Luella Avenue and Center Street between flags G and H. The highest instantaneous maximum concentration of toluene, at 53 ppbv (200 µg/m^3), was detected at 11.624 minutes into the monitoring run while traveling west on X Street between Luella Avenue and Center Street between flags G and H. The highest instantaneous maximum concentration of xylenes, at 21 ppbv (91 µg/m^3), was detected at 11.613 minutes into the monitoring run while traveling west on X Street between Luella Avenue and Center Street between flags G and H. The concentration for benzene and toluene exceeded the linear calibration range and is considered estimated.

4.25 Monitoring Deer Park Three, 64MSMS00834

Monitoring Deer Park Three was performed on 01 April 2019 at 15:27:18 and is represented in Figure 78. The average wind speed and direction for the five-minute period ending at 16:00 were 2.9 mph from 33 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 5,000 ppbv (16,000 µg/m^3), was detected at 25.329 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags J and K. The highest instantaneous maximum concentrations of toluene, at 2,500 ppbv (9,400 µg/m^3), and xylenes, at 2,600 ppbv (11,000 µg/m^3), were detected at 25.203 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags J and K. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.26 Monitoring Deer Park to Channelview, 64MSMS00858

Monitoring Deer Park to Channelview was performed on 04 April 2019 at 9:35:58 and is represented in Figure 26. The average wind speed and direction for the five-minute period ending at 10:00 were 9.6 mph from 200 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 2,400 ppbv (7,600 µg/m^3), and toluene, at 470 ppbv (1,800 µg/m^3), were detected at 45.872 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags K and L. The highest instantaneous maximum concentration of xylenes, at 2,400 ppbv (10,000 µg/m^3), was detected at 34.785 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags J and K. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.27 Monitoring Deer Park to Channelview, 64MSMS00898

Monitoring Deer Park to Channelview was performed on 08 April 2019 at 9:06:49 and is represented in Figure 27. The average wind speed and direction for the five-minute period ending at 9:00 were 8.8 mph from 329 degrees. There was 0.35 inches of precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 560 ppbv (1,800 µg/m^3), was detected at 25.234 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags J and K. The highest instantaneous maximum concentration of toluene, at 300 ppbv (1,100 µg/m^3), was detected at 38.140 minutes into the monitoring run

while traveling south on Independence Parkway near the Site between flags M and N. The highest instantaneous maximum concentration of xylenes, at 880 ppbv (3,800 µg/m^3), was detected at 38.466 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags M and N. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.28 Monitoring Channelview to Pasadena, 64MSMS00903

Monitoring Channelview to Pasadena was performed on 08 April 2019 at 15:01:48 and is represented in Figure 28. The average wind speed and direction for the five-minute period ending at 16:00 were 7.5 mph from 327 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 750 ppbv (2,400 µg/m^3), was detected at 57.095 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags T and U. The highest instantaneous maximum concentration of toluene, at 530 ppbv (2,000 µg/m^3), was detected at 57.116 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags T and U. The highest instantaneous maximum concentration of xylenes, at 1,100 ppbv (4,900 µg/m^3), was detected at 45.020 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags Q and R. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.29 Monitoring Deer Park to Channelview, 64MSMS00907

Monitoring Deer Park to Channelview was performed on 09 April 2019 at 9:07:10 and is represented in Figure 29. The average wind speed and direction for the five-minute period ending at 10:00 were 6.5 mph from 256 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 650 ppbv (2,100 µg/m^3), was detected at 38.425 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags N and O. The highest instantaneous maximum concentration of toluene, at 660 ppbv (2,500 µg/m^3), was detected at 51.562 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags Q and R. The highest instantaneous maximum concentration of xylenes, at 850 ppbv (3,700 µg/m^3), was detected at 38.414 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags N and O. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.30 Monitoring Lynchburg to Pasadena, 64MSMS00913

Monitoring Lynchburg to Pasadena was performed on 09 April 2019 at 16:19:46 and is represented in Figure 30. The average wind speed and direction for the five-minute period ending at 17:00 were 3.2 mph from 333 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 2,300 ppbv (7,300 µg/m^3), and toluene 1,200 ppbv (4,500 µg/m^3), were detected at 51.583 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags M and N. The highest instantaneous maximum concentration of xylenes, at 820 ppbv (3,500 µg/m^3), was detected at 40.886 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags J and K. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.31 Monitoring Pasadena to Deer Park, 64MSMS00917

Monitoring Pasadena to Deer Park was performed on 10 April 2019 at 8:34:25 and is represented in Figure 31. The average wind speed and direction for the five-minute period ending at 9:00 were 9.3 mph from 191 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 430 ppbv (1,400 µg/m^3), was detected at 41.296 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags N and O. The highest instantaneous maximum concentration of toluene, at 720 ppbv (2,700 µg/m^3), was detected at 41.117 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags N and O. The highest instantaneous maximum concentration of xylenes, at 770 ppbv (3,300 µg/m^3), was detected at 41.212 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags N and O. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.32 Monitoring Pasadena to Deer Park, 64MSMS00930

Monitoring Pasadena to Deer Park was performed on 11 April 2019 at 10:06:59 and is represented in Figure 32. The average wind speed and direction for the five-minute period ending at 10:00 were 9.9 mph from 190 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 180 ppbv (580 µg/m^3), was detected at 43.242 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags L and M. The highest instantaneous maximum concentration of toluene, at 53 ppbv (200 µg/m^3), was detected at 43.252 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags L and M. The highest instantaneous maximum concentration of xylenes, at 8.1 ppbv (35 µg/m^3), was detected at 43.231 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags L and M. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.33 Monitoring Channelview to Deer Park, 64MSMS00935

Monitoring Channelview to Deer Park was performed on 11 April 2019 at 15:22:24 and is represented in Figure 33. The average wind speed and direction for the five-minute period ending at 16:00 were 6.6 mph from 167 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 180 ppbv (560 µg/m^3), was detected at 48.575 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags R and S. The highest instantaneous maximum concentration of toluene, at 61 ppbv (230 µg/m^3), was detected at 48.113 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags Q and R. The highest instantaneous maximum concentration of xylenes, at 130 ppbv (570 µg/m^3), was detected at 47.702 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags Q and R. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.34 Monitoring Channelview to Baytown, 64MSMS00953

Monitoring Channelview to Baytown was performed on 13 April 2019 at 15:06:45 and is represented in Figure 34. The average wind speed and direction for the five-minute period ending at 16:00 were 5.5 mph from 311 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 940 ppbv (3,000 µg/m^3), and

xylenes, at 1,200 ppbv (5,300 µg/m^3), were detected at 83.517 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags D1 and E1. The highest instantaneous maximum concentration of toluene, at 480 ppbv (1,800 µg/m^3), was detected at 83.506 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags D1 and E1. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.35 Monitoring Pasadena to Deer Park, 64MSMS00957

Monitoring Pasadena to Deer Park was performed on 14 April 2019 at 12:34:47 and is represented in Figure 35. The average wind speed and direction for the five-minute period ending at 13:00 were 8.3 mph from 319 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 890 ppbv (2,900 µg/m^3), and toluene, at 860 ppbv (3,200 µg/m^3), were detected at 27.149 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags K and L. The highest instantaneous maximum concentration of xylenes, at 2,600 ppbv (11,000 µg/m^3), was detected at 27.004 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags K and L. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.36 Monitoring Deer Park to Baytown, 64MSMS00959

Monitoring Deer Park to Baytown was performed on 14 April 2019 at 14:35:10 and is represented in Figure 36. The average wind speed and direction for the five-minute period ending at 15:00 were 7.0 mph from 321 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 630 ppbv (2,000 µg/m^3), was detected at 105.932 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags I1 and J1. The highest instantaneous maximum concentration of toluene, at 490 ppbv (1,800 µg/m^3), was detected at 106.048 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags I1 and J1. The highest instantaneous maximum concentration of xylenes, at 3,300 ppbv (14,000 µg/m^3), was detected at 106.153 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags I1 and J1. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.37 Monitoring Pasadena to Baytown, 64MSMS00982

Monitoring Pasadena to Baytown was performed on 18 April 2019 at 13:52:52 and is represented in Figure 37. The average wind speed and direction for the five-minute period ending at 14:00 were 8.9 mph from 302 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 820 ppbv (2,600 µg/m^3), was detected at 42.001 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags J and K. The highest instantaneous maximum concentration of toluene, at 240 ppbv (890 µg/m^3), was detected at 24.057 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags G and H. The highest instantaneous maximum concentration of xylenes, at 780 ppbv (3,400 µg/m^3), was detected at 24.120 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags G and H. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.38 Monitoring Lynchburg to Deer Park, 64MSMS00984

Monitoring Lynchburg to Deer Park was performed on 18 April 2019 at 15:50:31 and is

represented in Figure 38. The average wind speed and direction for the five-minute period ending at 16:00 were 8.3 mph from 318 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 870 ppbv (2,800 µg/m^3), was detected at 30.367 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags H and I. The highest instantaneous maximum concentration of toluene, at 200 ppbv (750 µg/m^3), was detected at 42.516 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags J and K. The highest instantaneous maximum concentration of xylenes, at 560 ppbv (2,400 µg/m^3), was detected at 30.136 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags H and I. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.39 Monitoring Pasadena to Deer Park, 64MSMS00988

Monitoring Pasadena to Deer Park was performed on 19 April 2019 at 8:42:14 and is represented in Figure 39. The average wind speed and direction for the five-minute period ending at 9:00 were 6.7 mph from 334 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 360 ppbv (1,100 µg/m^3), was detected at 18.008 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags F and G. The highest instantaneous maximum concentration of toluene, at 360 ppbv (1,400 µg/m^3), was detected at 18.050 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags F and G. The highest instantaneous maximum concentration of xylenes, at 490 ppbv (2,100 µg/m^3), was detected at 17.630 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags E and F. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.40 Monitoring Deer Park to La Porte, 64MSMS00989

Monitoring Deer Park to La Porte was performed on 19 April 2019 at 9:29:22 and is represented in Figure 40. The average wind speed and direction for the five-minute period ending at 10:00 were 8.2 mph from 319 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 1,000 ppbv (3,200 µg/m^3), was detected at 79.635 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags T and U. The highest instantaneous maximum concentration of toluene, at 170 ppbv (620 µg/m^3), was detected at 79.562 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags T and U. The highest instantaneous maximum concentration of xylenes, at 490 ppbv (2,100 µg/m^3), was detected at 80.203 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags T and U. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.41 Monitoring Deer Park, 64MSMS00992

Monitoring Deer Park was performed on 19 April 2019 at 13:18:23 and is represented in Figure 41. The average wind speed and direction for the five-minute period ending at 14:00 were 10.8 mph from 322 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 770 ppbv (2,500 µg/m^3), was detected at 21.627 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags G and H. The highest instantaneous maximum concentration of toluene, at 180 ppbv (670 µg/m^3), was detected at 21.890 minutes into the monitoring run while

traveling north on Independence Parkway near the Site between flags H and I. The highest instantaneous maximum concentration of xylenes, at 620 ppbv (2,700 µg/m^3), was detected at 37.478 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags J and K. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.42 Monitoring La Porte to Deer Park, 64MSMS00995

Monitoring La Porte to Deer Park was performed on 19 April 2019 at 16:02:31 and is represented in Figure 42. The average wind speed and direction for the five-minute period ending at 16:00 were 8.6 mph from 310 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 810 ppbv (2,600 µg/m^3), was detected at 38.803 minutes into the monitoring run while traveling south on Independence Parkway near the Site between flags K and L. The highest instantaneous maximum concentration of toluene, at 260 ppbv (990 µg/m^3), was detected at 25.255 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags J and K. The highest instantaneous maximum concentration of xylenes, at 920 ppbv (4,000 µg/m^3), was detected at 25.171 minutes into the monitoring run while traveling north on Independence Parkway near the Site between flags I and J. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.43 Monitoring Deer Park to Channelview, 64MSMS01043

Monitoring Deer Park to Channelview was performed on 24 April 2019 at 10:12:32 and is represented in Figure 43. The average wind speed and direction for the five-minute period ending at 11:00 were 11.9 mph from 122 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 910 ppbv (2,900 µg/m^3), was detected at 55.159 minutes into the monitoring run while traveling north on Lakeside Drive between flags R and S. The highest instantaneous maximum concentration of toluene, at 310 ppbv (1,200 µg/m^3), was detected at 55.191 minutes into the monitoring run while traveling north on Lakeside Drive between flags R and S. The highest instantaneous maximum concentration of xylenes, at 3,700 ppbv (16,000 µg/m^3), was detected at 55.201 minutes into the monitoring run while traveling north on Lakeside Drive between flags R and S. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.44 Monitoring Pasadena to Deer Park, 64MSMS01071

Monitoring Pasadena to Deer Park was performed on 27 April 2019 at 8:39:19 and is represented in Figure 44. The average wind speed and direction for the five-minute period ending at 9:00 were 8.7 mph from 183 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 520 ppbv (1,700 µg/m^3), was detected at 29.031 minutes into the monitoring run while traveling west on Tidal Road near the Site between flags J and K. The highest instantaneous maximum concentration of toluene, at 280 ppbv (1,000 µg/m^3), was detected at 38.372 minutes into the monitoring run while traveling west on Tidal Road near the Site between flags J and K. The highest instantaneous maximum concentration of xylenes, at 8,100 ppbv (35,000 µg/m^3), was detected at 28.569 minutes into the monitoring run while traveling west on Tidal Road near the Site between flags J and K. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.45 Monitoring Pasadena to Deer Park, 64MSMS01072

Monitoring Pasadena to Deer Park was performed on 27 April 2019 at 9:29:31 and is represented in Figure 45. The average wind speed and direction for the five-minute period ending at 10:00 were 9.4 mph from 166 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 190 ppbv (610 µg/m^3), was detected at 64.794 minutes into the monitoring run while traveling north on Lakeside Drive between flags T and U. The highest instantaneous maximum concentration of toluene, at 45 ppbv (170 µg/m^3), was detected at 64.752 minutes into the monitoring run while traveling north on Lakeside Drive between flags T and U. The highest instantaneous maximum concentration of xylenes, at 54 ppbv (230 µg/m^3), was detected at 64.773 minutes into the monitoring run while traveling north on Lakeside Drive between flags T and U. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.46 Monitoring Pasadena to Deer Park, 64MSMS01087

Monitoring Pasadena to Deer Park was performed on 28 April 2019 at 15:32:38 and is represented in Figure 46. The average wind speed and direction for the five-minute period ending at 16:00 were 11.0 mph from 128 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentrations of benzene, at 490 ppbv (1,600 µg/m^3), and toluene, at 46 ppbv (175 µg/m^3), were detected at 48.964 minutes into the monitoring run while traveling north on Lakeside Drive between flags M and N. The highest instantaneous maximum concentration of xylenes, at 28 ppbv (120 µg/m^3), was detected at 48.953 minutes into the monitoring run while traveling north on Lakeside Drive between flags M and N. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.47 Monitoring Highway 8 to Command Post, 64MSMS01090

Monitoring Highway 8 to Command Post was performed on 29 April 2019 at 8:40:24 and is represented in Figure 47. The average wind speed and direction for the five-minute period ending at 9:00 were 12.3 mph from 159 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 460 ppbv (1,500 µg/m^3), was detected at 54.423 minutes into the monitoring run while traveling east on Tidal Road near the Site between flags R and S. The highest instantaneous maximum concentration of toluene, at 99 ppbv (370 µg/m^3), was detected at 54.434 minutes into the monitoring run while traveling east on Tidal Road near the Site between flags R and S. The highest instantaneous maximum concentration of xylenes, at 9,900 ppbv (43,000 µg/m^3), was detected at 55.117 minutes into the monitoring run while traveling east on Tidal Road near the Site between flags R and S. The concentrations for benzene, toluene and xylenes exceeded the linear calibration range and are considered estimated.

4.48 Monitoring Channelview, 64MSMS01102

Monitoring Channelview was performed on 30 April 2019 at 10:49:28 and is represented in Figure 48. The average wind speed and direction for the five-minute period ending at 11:00 were 15.4 mph from 144 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 480 ppbv (1,500 µg/m^3), was detected at 8.804 minutes into the monitoring run while traveling south on Lakeside Drive between flags C and D. The highest instantaneous maximum concentration of toluene, at 39 ppbv (150 µg/m^3), was detected at 8.794 minutes into the monitoring run while traveling south on Lakeside Drive between flags C and D. The highest instantaneous maximum concentration of xylenes, at 130 ppbv (550 µg/m^3), was detected at 37.267 minutes into the monitoring run while traveling northeast on Market Street between flags M and N. The concentrations for benzene,

toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.49 Monitoring Channelview Two, 64MSMS01103

Monitoring Channelview Two was performed on 30 April 2019 at 11:36:36 and is represented in Figure 49. The average wind speed and direction for the five-minute period ending at 12:00 were 15.5 mph from 146 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 210 ppbv (680 µg/m^3), was detected at 7.469 minutes into the monitoring run while traveling south on Lakeside Drive between flags F and G. The highest instantaneous maximum concentration of toluene, at 56 ppbv (210 µg/m^3), was detected at 7.458 minutes into the monitoring run while traveling south on Lakeside Drive between flags F and G. The highest instantaneous maximum concentration of xylenes, at 15 ppbv (66 µg/m^3), was detected at 7.658 minutes into the monitoring run while traveling south on Lakeside Drive between flags G and H. The concentrations for benzene and toluene exceeded the linear calibration range and are considered estimated.

4.50 Monitoring Jacinto City to Channelview, 64MSMS01120

Monitoring Jacinto City to Channelview was performed on 02 May 2019 at 11:01:51 and is represented in Figure 50. The average wind speed and direction for the five-minute period ending at 12:00 were 15.1 mph from 116 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 480 ppbv (1,500 µg/m^3), was detected at 53.393 minutes into the monitoring run while traveling east on Dezavala Road/Lakeside Drive between flags R and S. The highest instantaneous maximum concentrations of toluene, at 110 ppbv (420 µg/m^3), and xylenes, at 48 ppbv (210 µg/m^3), were detected at 53.214 minutes into the monitoring run while traveling east on Dezavala Road/Lakeside Drive between flags R and S. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.51 Monitoring Channelview, 64MSMS01123

Monitoring Channelview was performed on 02 May 2019 at 13:43:38 and is represented in Figure 51. The average wind speed and direction for the five-minute period ending at 14:00 were 12.6 mph from 117 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 200 ppbv (630 µg/m^3), was detected at 40.455 minutes into the monitoring run while traveling south on Lakeside Drive between flags I and J. The highest instantaneous maximum concentration of toluene, at 26 ppbv (99 µg/m^3), was detected at 11.897 minutes into the monitoring run while traveling north on Sheldon Road between flags E and F. The highest instantaneous maximum concentration of xylenes, at 420 ppbv (1,800 µg/m^3), was detected at 28.180 minutes into the monitoring run while traveling west on Market Street near Southwest Shipyard between flags H and I. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.52 Monitoring Channelview, 64MSMS01143

Monitoring Channelview was performed on 09 May 2019 at 11:09:06 and is represented in Figure 52. The average wind speed and direction for the five-minute period ending at 11:00 were 4.0 mph from 195 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 230 ppbv (730 µg/m^3), was detected at 9.446 minutes into the monitoring run while traveling north on Lakeside Drive

between flags D and E. The highest instantaneous maximum concentration of toluene, at 49 ppbv (180 µg/m^3), was detected at 9.509 minutes into the monitoring run while traveling north on Lakeside Drive between flags D and E. The highest instantaneous maximum concentration of xylenes, at 120 ppbv (540 µg/m^3), was detected at 5.050 minutes into the monitoring run while traveling north on Lakeside Drive between flags D and E. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

4.53 Monitoring ITC Site Three, 64MSMS01197

Monitoring ITC Site Three was performed on 16 May 2019 at 10:57:26 and is represented in Figure 52. The average wind speed and direction for the five-minute period ending at 11:00 were 9.3 mph from 101 degrees. There was no precipitation measured during the preceding hour.

The highest instantaneous maximum concentration of benzene, at 320 ppbv (1,000 µg/m^3), was detected at 54.970 minutes into the monitoring run while monitoring through the ITC facility between flags L and M. The highest instantaneous maximum concentration of toluene, at 150 ppbv (550 µg/m^3), was detected at 54.949 minutes into the monitoring run while monitoring through the ITC facility between flags L and M. The highest instantaneous maximum concentration of xylenes, at 930 ppbv (4,000 µg/m^3), was detected at 54.886 minutes into the monitoring run while monitoring through the ITC facility between flags L and M. The concentrations for benzene, toluene, and xylenes exceeded the linear calibration range and are considered estimated.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The compound parent/daughter ion pairs used are listed below.

Compound	Parent Ion Mass	Daughter Ion Mass
Benzene	78	39
Benzene	78	52
Toluene	92	65
Toluene	92	91
Xylene	106	65
Xylene	106	91

Table 2 documents the RFs and IRFs generated during the calibration procedure for the individual ion pairs. The RFs or IRFs were used to quantitate the ion pair concentrations. An end-of-day calibration was not performed on 15 April 2019 due to a vehicle maintenance issue, or on 07 May 2019 due to a local weather emergency. As such, no IRFs or Error Bars were calculated for data files 64MSMS00962, 64MSMS00963, 64MSMS01129, 64MSMS01130, 64MSMS01131, and 64MSMS01132. No results above the AHCV were observed for these data files.

The summaries of detection and quantitation limit data for the monitoring periods (Sections 5.3 and 5.4 and Table 3) document the concentration in ppbv required for a compound's ion pair to be considered detectable and quantifiable during the specified monitoring period. The detection limit (DL) is defined as three times the standard deviation (SD) of the concentration for a compound's ion pair measured in an ambient air sample. The QL is defined as 10 times the SD of the concentration for the same conditions. The detection and quantitation limits for a compound result from averaging the appropriate detection and quantitation limits of the compound’s ion pairs.

5.1 Intermediate Response Factor for Ion Pairs

Response factors were generated from two calibration events, as described in the procedure (Section 2.2.2.). Table 2 contains the RFs in units of icps/ppbv. The initial and final RFs were

used to calculate the IRFs, which were used to calculate the reported concentration results.

The following equation was used to calculate the IRFs found in Tables 2 and 3:

$$IRF = \frac{2(RF_1 \times RF_2)}{(RF_1 + RF_2)}$$

where:

IRF = Intermediate response factor (icps/concentration)
RF_1 = The RF for an ion pair measured during the first calibration event (icps/concentration)
RF_2 = The RF for the same ion pair measured during the second calibration event (icps/concentration)

For example, the entry for the 78/39 ion pair of benzene from Table 2 for files 64MSMS00708 and 64MSMS00713, 20 March 2019 is:

RF_1 = 6.2740 icps/ppbv
RF_2 = 6.1628 icps/ppbv

therefore,

$$IRF = \frac{2\ (6.2740 \text{ x } 6.1628)}{(6.2740 + 6.1628)} = \frac{77.3308}{12.4368} = 6.2179$$

The result, 6.2179 icps/ppbv, is the IRF reported in Table 2 and used in Table 3.

5.2 Error Bars

The potential maximum concentration percent deviations for each target compound are presented in Table 2 and are called “error bars” for simplicity. They represent the potential bias in the concentration due to changes in the sensitivity of the TAGA instrument. Errors bars were calculated using the following equation:

$$\text{error bar} = \frac{\left|RF_1 - RF_2\right|}{(RF_1 + RF_2)} \times 100$$

where:

error bar = Maximum concentration percent deviation
RF_1 = The RF for an ion pair measured during the first calibration event (icps/concentration)
RF_2 = The RF for the same ion pair measured during the second calibration event (icps/concentration)

For example, the entry for the 78/39 ion pair of benzene from Table 2 for files 64MSMS00708 and 64MSMS00713, 20 March 2019 is:

RF_1 = 6.2740 icps/ppbv
RF_2 = 6.1628 icps/ppbv

Therefore:

$$\text{error bar} = \frac{|6.2740-6.1628|}{(6.2740+6.1628)} \text{ x } 100 = \frac{0.1112}{12.4368} \text{ x } 100 = 0.894$$

The % error bar calculated for the 78/39 ion pair of benzene is 0.894% for files 64MSMS00708 and 64MSMS00713, 20 March 2019.

The above calculation was repeated for each ion pair. The error bars for each compound's ions were averaged to give a single value for the compound. This averaged error bar can be applied to the samples analyzed between the two calibrations of the monitoring period.

5.3 Ion Pair Detection and Quantitation Limits

The DLs and QLs were calculated using the SD of the compound's ion pair intensity measured in an ambient air sample and its RF or IRF. The SD reflects the variability of the instrument's response to the ambient air sample.

The following equation was used to calculate the DLs found in Table 3:

$$DL = \frac{3 \times SD}{RF \text{ or } IRF}$$

where:

DL = Detection limit for an ion pair (concentration)
SD = Standard deviation of the ion intensity measured in an ambient air sample (icps)
RF or IRF = Response or intermediate response factor for an ion pair (icps/concentration)

For example, the entry for the 78/39 ion pair of benzene from Table 2 for files 64MSMS00708 and 64MSMS00713, 20 March 2019 is:

SD = 7.1451 icps
IRF = 6.2179 icps/ppbv

$$DL = \frac{3 \text{ x } 7.1451}{6.2179} = 3.45 \text{ ppbv}$$

The following equation was used to calculate the QLs found in Table 3:

$$QL = \frac{10 \times SD}{RF \text{ or } IRF}$$

where:

QL = Quantitation limit concentration for an ion pair (concentration)
SD = Standard deviation of the ion intensity measured in an ambient air sample (icps)
RF or IRF = Response or intermediate response factor for an ion pair (icps/concentration)

For example, the entry for the 78/39 ion pair of benzene from Table 3 for files 64MSMS01154 and 64MSMS01160, 11 May 2019 is:

SD = 7.1451 icps
IRF = 6.2179 icps/ppbv

$$QL = \frac{10 \text{ x } 7.1541}{6.2179} = 11.5 \text{ ppbv}$$

5.4 Compound Detection and Quantitation Limits

Averaging the respective DLs and QLs of the target compound's ion pairs generated the DLs and QLs found in Table 3.

The following equation was used to calculate the compound's DL:

$$DL_c = \frac{DL_1 + DL_2 + \ldots + DL_n}{n}$$

where:

DL_c = Detection limit for a compound (concentration)
DL_1 = Detection limit for the first ion pair (concentration)
DL_2 = Detection limit for the second ion pair (concentration)
DL_n = Detection limit for the n^{th} ion pair (concentration)
n = Number of ion pairs to be averaged

For example, using the entries for the 78/39 and 78/52 ion pairs of benzene from Table 3 for files 64MSMS00708 and 64MSMS00713, 20 March 2019 is:

$$DL_c = \frac{3.45 + 1.12}{2} = \frac{4.57}{2} = 2.285 \text{ ppbv}$$

This result, 2.285 ppbv, rounded to 2.3 ppbv is the DL for benzene found in Table 3.

The following equation was used to calculate the compound's QL:

$$QL_c = \frac{QL_1 + QL_2 + \ldots QL_n}{n}$$

where:

QL_c = Quantitation limit for a compound (concentration)
QL_1 = Quantitation limit for the first ion pair (concentration)
QL_2 = Quantitation limit for the second ion pair (concentration)
QL_n = Quantitation limit for the n^{th} ion pair (concentration)
n = Number of ion pairs to be averaged

For example, using the entries for the 78/39 and 78/52 ion pairs of benzene from Table 3 for files 64MSMS00708 and 64MSMS00713, 20 March 2019 is:

$$QL_c = \frac{11.5 + 3.73}{2} = \frac{15.23}{2} = 7.615 \text{ ppbv}$$

This result, 7.615 ppbv, rounded to 7.6 ppbv is the QL for benzene found in Table 3.

TABLES

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FIGURES

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APPENDIX A

Standard Gas Cylinder Certification

Intercontinental Terminals Company Emergency Response

Final Analytical TAGA Report

July 2019

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ISO 9001:2008 Linde **SPECTRA** Environmental Gases, 80 Industrial Drive, Alpha, NJ 08865

THE LINDE GROUP

SHIPPED TO: Leidos Innovations Corporation
109 TW Alexander Dr
Durham, NC 27709-0002

PAGE: 1 of 1

CERTIFICATE OF ANALYSIS

Sales#:	116981059	**Cylinder Size:**	152 (8" X 47.5")
Production#:	1476496	**Cylinder # :**	CC-128272
Certification Date:	Dec-10-2018	**Cylinder Pressure:**	1100 psig
P.O.# :	CC-Danielle McCall	**Cylinder Valve:**	CGA 350 / Steel
Blend Type:	CERTIFIED	**Cylinder Volume:**	29.5 Liter
Material#:	24086389	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	2200 Liters
Expiration Date:	Dec-10-2019	**Blend Tolerance:**	5% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	2% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Vinyl Chloride	75-01-4	20.0 ppm	20.7 ppm
1,1-Dichloroethene	75-35-4	20.0 ppm	20.7 ppm
Benzene	71-43-2	20.0 ppm	20.8 ppm
Trichloroethylene	79-01-6	20.0 ppm	20.8 ppm
Toluene	108-88-3	20.0 ppm	20.8 ppm
Tetrachloroethylene	127-18-4	20.0 ppm	20.8 ppm
P-Xylene	106-42-3	10.0 ppm	10.4 ppm
M-Xylene	108-38-3	10.0 ppm	10.4 ppm
O-Xylene	95-47-6	10.0 ppm	10.5 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Justin Kutz

DATE: Dec-11-2018

Received 12/20/18 ~1050 psi

Linde Gas North America LLC

(908) 329-9700 Main (908) 329-9740 Fax
www.Lindeus.com

ISO 9001:2008 Linde SPECTRA Environmental Gases, 80 Industrial Drive, Alpha, NJ 08865

THE LINDE GROUP

Linde

SHIPPED TO: Leidos Innovations Corporation
2890 Woodbridge Ave.
Edison, NJ 08837-3679

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CERTIFICATE OF ANALYSIS

Sales#:	116469142	**Cylinder Size:**	152 (8" X 47.5")
Production#:	3146050	**Cylinder # :**	CC-256091
Certification Date:	Jun-21-2018	**Cylinder Pressure:**	500 psig
P.O.# :	TBD - Recert	**Cylinder Valve:**	CGA 350 / Steel
Blend Type:	CERTIFIED	**Cylinder Volume:**	29.5 Liter
Material#:	14004551	**Cylinder Material:**	Aluminum
Traceability:	NIST by weight	**Gas Volume:**	1000 Liters
Expiration Date:	Jun-21-2019	**Blend Tolerance:**	5% Relative
Do NOT use under:	150 psig	**Analytical Accuracy:**	2% Relative

COMPONENT	CAS NUMBER	REQUESTED CONC	CERTIFIED CONC
Vinyl Chloride	75-01-4	20.0 ppm	19.3 ppm
1,1-Dichloroethene	75-35-4	20.0 ppm	19.9 ppm
Benzene	71-43-2	20.0 ppm	19.9 ppm
Trichloroethylene	79-01-6	20.0 ppm	20.0 ppm
Toluene	108-88-3	20.0 ppm	20.4 ppm
Tetrachloroethylene	127-18-4	20.0 ppm	20.3 ppm
p-xylene	106-42-3	10.0 ppm	10.8 ppm
m-xylene	108-38-3	10.0 ppm	10.8 ppm
o-xylene	95-47-6	10.0 ppm	10.7 ppm
Nitrogen	7727-37-9	Balance	Balance

ANALYST: Lou Lorenzetti **DATE:** Jun-21-2018

Linde Gas North America LLC

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APPENDIX B

Calibration Data

Intercontinental Terminals Company Emergency Response

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APPENDIX C

Compiled Meteorological Data

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